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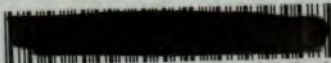
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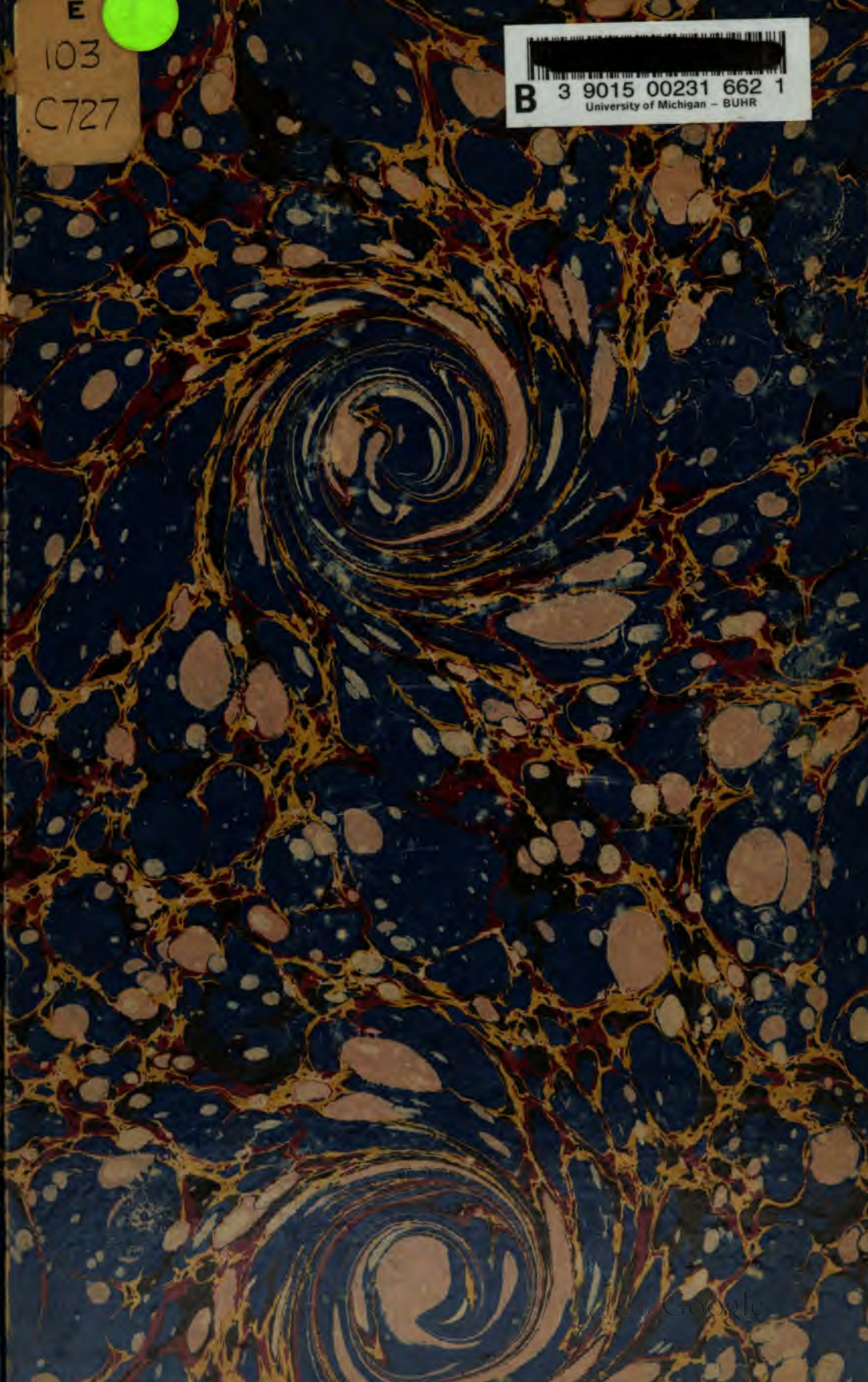
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Geographical and Mathematical Discussion
OF
PLUTARCH'S ACCOUNT
OF
Ancient Voyages to the New World.

BY
VERPLANCK COLVIN.

Read before the
ALBANY INSTITUTE,

APRIL 4, 1893.

PLUTARCH'S ACCOUNT OF ANCIENT VOYAGES TO THE NEW WORLD

CONSIDERED FROM THE STANDPOINT OF NAUTICAL ASTRONOMY, AND AS
A POPULAR STATEMENT OR ABBREVIATION OF ANCIENT SAILING
DIRECTIONS OF THE GREEKS, PHœNICIANS OR CARTHAGINIANS.

By VERPLANCK COLVIN.

[Read before the Albany Institute April 4th, 1893.]

At this time, when we are as a Nation celebrating the four hundredth anniversary of the discovery of this continent by Columbus, everything relating to similar voyages, particularly whatever may explain the brief references by Homer, Solon, Aristotle, Pliny, and other ancients to "distant lands beyond the great ocean," possesses unusual interest. This interest is not aroused by idle curiosity, but is based upon the historical value which the ancient data may afford to enable the student of civilization to judge of the accuracy and extent of astronomical and geographical knowledge in most remote times of which there are any records; data affording a check or test on the accuracy of such records and, by a study of man's past achievements, giving some idea of what we may hope for in the future.

Many years ago I was surprised to find, in one of Plutarch's philosophical disquisitions, what was evidently an account of voyages across the Atlantic to what must have been the continent on which we now reside.

The particular interest which attaches to this record by Plutarch consists in the references to astronomical phenomena, to the position of the sun and planets, to the statements of courses and distances, which, though couched in general language, constitute, I find by computation, almost exact sailing directions for the navigation of a ship from the Old World to the New: a faithful, accurate account, worthy of the great Plutarch.

The exact period when these sailing directions were in use, the time when the voyages were made, is lost in the dim vistas of the past. Whether the adventurous sailors of the period were Phœnicians or Carthaginians, Asiatics or Africans, is not certain, though a reference to a return to "Carthage," as the closure of the traverse, points to that city as the place of beginning.

Whoever these ancient navigators were, it is clear that they possessed a knowledge of astronomy sufficient for purposes of navigation, and that they had remarkably accurate information as to the periodic position of at least one of the planets of our solar system, together with ability to set forth and explain the "sailing directions" used by them on voyages to this continent. Whatever is obscure in the account of these voyages, which we are now considering, was perhaps intentional upon the part of these navigators, unwilling to reveal what, to them, were commercial business secrets, though some of the vagueness may be attributed to the misunderstanding of the navigators by those who obtained the information or communicated it to the historian; and he, in turn, was probably not sufficiently versed in navigation to detect these imperfections.

Plutarch tells the story of these ancient navigators so briefly, that it may be well to first call to mind some of the many references to the existence of a continent beyond the "great ocean" in the ancient writings already referred to; but, as my purpose is to particularly discuss the outgoing and return voyage described by Plutarch, and to mathematically consider the courses and distances he mentions, I will omit consideration of those words of other historians which merely confirm the belief that this country was known for ages before the Christian era; accepting the early knowledge of this country by these ancient navigators as a fact established; and devote my attention to identifying the localities visited by Plutarch's voyagers from the statements made in his narrative.

In the study of the distances used, in the sailing directions of such an ancient voyage, the first essential, in considering the "reckoning," is to obtain the unit of measurement correctly, and some proof as to the distances actually sailed in those days.

An idea of the distances sailed by the ancient navigators may be had from Homer, who, in his *Odyssey*, tells us: "Ogygia is an island far out at sea" [*Ατλαντος* in the Greek text], "where the daughter of Atlas dwells" [*i. e.*, in the great gulf], "crafty Kalypso, a fair-haired powerful goddess," etc.; and he tells how Odysseus, having sailed "eighteen days" across the sea, eastward or homeward, was guided towards Europe by keeping the pole star; [the text says "the Bear"] "at his left," according to the instructions of the goddess.

This proves (1st) that in the days of Homer, or rather before his time, navigators traveled thousands of miles out into the Atlantic, and back across it; and (2d) that they were guided in their voyages by the stars. The distance thus traveled in eighteen days, in ordinary weather, may be ascertained from accounts of the speed of vessels in ancient times given by the father of history.

Herodotus says, telling how he got his distances for geographical purposes (Book IV, § 86): "In a long day a vessel generally accomplishes about 70,000 fathoms; in the night about 60,000." That is to say, about 420,000 + 360,000 feet, which equals 147 miles per day. Hence in eighteen days, multiplying by 147, a distance of more than 2,646 miles might have been sailed in those times, and how much further before strong Atlantic gales we are at liberty to estimate.

The longitude of Barbadoes, in the West India Islands, is $59^{\circ} 37'$ west; that of the Cape Verde Island, St. Vincent, $25^{\circ} 17'$ west, and the difference of longitude is about $34\frac{1}{2}$ degrees, equal to 2,294 statute miles — or over 352 miles less than the distance recorded by Homer, but it must be remembered that the Cape Verde Islands are only 350 miles from the coast of Africa,* the approximate easterly shore of the continent to which Odysseus returns; and $2,294 + 350 = 2644$.

The fame of Homer's story probably made all islands or lands found in the Atlantic "Ogygias," so that Plutarch's island was, probably, only one of many claimed as the island which Homer mentioned.

These references suffice to show that Homer and the other ancient writers had a fairly accurate knowledge of the distance to the West Indian islands, and that the sailors of those times must have made voyages into our seas in order to have had such an accurate knowledge.

As to the passenger accommodations and size of ships in those days we learn that, before the time of Plutarch, a vessel in the Mediterranean had carried "Two hundred three score and sixteen souls." †

With this introduction, we may take up the detailed account of the voyage given in Plutarch's *Morals*, Vol. V, pages 281-284 (8th edition, Boston: Little Bros. & Co., 1878), where, in his dialogue about our satellite, the Moon, he says:

‡(1) "AN ISLE OGYGIA LIES IN OCEAN'S ARMS," § distant about five days' sail westward from Britain; and before it there are three others, of an equal distance from one another and also from that, (2) bearing north-west, where the sun sets in summer. In one of these the barbarians feign that Saturn is detained prisoner by Jupiter, who, as his son, having the guard or keeping of those islands and the adjacent sea, named the Saturnian, has his seat a little below; and that (3) the continent, by which the great sea is circularly environed, is distant from Ogygia about five thousand stadia, (4) but from the others not so far, men using to row thither in galleys, (5) the sea being there

* Bonavista I. to Cape Verde.

† Acts of the Apostles, Ch. 27, verse 37.

‡ The figures inserted in this text refer to corresponding passages in the commentary which follows.

§ Quoting Homer.

low and ebb, and difficult to be passed by great vessels because of the mud brought thither by a multitude of rivers, which, coming from the mainland, discharge themselves into it, and raise there great bars and shelves that choke up the river and render it hardly navigable; (6) whence anciently there arose an opinion of its being frozen. Moreover, (7) the coasts of this continent lying on the sea are inhabited by the Greeks about a bay not much smaller than the Maeotic, the mouth of which lies in a direct line over against that of the Caspian Sea. (8) These name and esteem themselves the inhabitants of the firm land, calling all us others islanders, as dwelling in a land encompassed round about and washed by the sea. And they think that (9) those who heretofore came thither with Hercules and were left there by him, mixing themselves with the people of Saturn, raised up again the Greek nation, which was well near extinguished, brought under and supplanted by the language, laws, and manners of the barbarians, and made it again flourish and recover its pristine vigor. And therefore in that place they give the first honor to Hercules, and the second to Saturn. (10) Now when the star of Saturn, by us called Phaenon and by them Nycturus, comes to the sign of Taurus, as it does once in the time of thirty years, they, having been a long time preparing what is necessary for a solemn sacrifice and a long voyage or navigation, send forth those on whom the lots fall to row in that vast sea, and make their abode for a great while in foreign countries. (11) These men then, being embarked and departed, meet with different adventures, some in one manner, others in another. Now such as have in safety passed the danger of the sea go first ashore in those opposite islands, which are (12) inhabited by the Greeks, where they see that the sun is scarce hidden one full hour during the space of thirty days, and that this is their night, of which the darkness is but small, as having a twilight from the going down of the sun not unlike the dawning of the day; that (13) having continued there ninety days, during which they are highly caressed and honored, as being reputed and termed holy men, they are afterwards conducted by the winds, and (14) transported into the Isle of Saturn, where there are no other inhabitants but themselves and such as have been sent thither before them. For though it is lawful for them, after they have served Saturn thirty years, to return home to their own countries and houses, yet most of them choose rather to remain quietly there; some, because they are already accustomed to the place; others, because (15) without any labor and trouble they have abundance of all things, as well for the offering of sacrifices (16) and holding festival solemnities, as to support the ordinary expenses of those who are perpetually conversant in the study of learning and philosophy. (17) For they affirm the

nature of the island and the mildness of the air which environs it to be admirable ; and that there have been some persons who, intending to depart thence, have been hindered by the Divinity or (18) Genius of the place showing himself to them, as to his familiar friends and acquaintance, not only in dreams and exterior signs, but also visibly appearing to them by the means of familiar spirits discoursing and conversing with them. For they say, that Saturn himself is personally there lying asleep in the deep (19) cave of an hollow rock, shining like fine gold, Jupiter having prepared sleep instead of fetters and shackles to keep him from stirring ; but that there are on the top of this rock certain birds, which fly down and carry him ambrosia ; (20) that the whole island is filled with an admirable fragrancy and perfume, which is spread all over it, arising from this cave, as from an odoriferous fountain ; (21) that these Daemons serve and minister to Saturn, having been his courtiers and nearest attendants when he held the empire and exercised regal authority over men and gods ; and that having the science of divining future occurrences, they of themselves foretell many things ; but the greatest and of the highest importance, when they return from assisting Saturn, and reveal his dreams ; for whatever Jupiter premeditates, Saturn dreams ; (22) but his awakenings are Titanical passions or perturbations of the soul in him, which sleep altogether controls, in order that the royal and divine nature may be pure and incontaminate in itself. (23) This stranger then, having been brought thither, and there serving the god in repose and at his ease, attained to as great skill in astrology as it is possible for any one to do that has made the greatest progress in geometry ; as for the rest of philosophy, having given himself to that which is called natural, (24) he was seized with an extraordinary desire and longing to visit and see the great island ; for so they called the continent inhabited by us. After therefore his thirty years were passed and his successors arrived, having taken leave of all his relations and friends, he put to sea, in other respects soberly and moderately equipped, but having good store of voyage-provision in vessels of gold. (25) Now one day would not suffice to relate unto you in particular what adventures befell him, how many nations he visited, through how many countries he passed, how he searched into sacred writings, and was initiated in all holy confraternities and religious societies, as he himself recounted it to us, exactly particularizing every thing. But give ear, I pray you, to what concerns the present dispute. (26) For he continued no small time at Carthage, a city not a little also esteemed by us, where he found certain sacred skins of parchment, which had been secretly conveyed thither when the old town was sacked, and had there long lain hidden under ground."

COMMENTARY.*

(1) Plutarch omits the courses and distances through the Mediterranean and the Atlantic to the coast of Britain, as though sufficiently well known, and takes up the journey at the point where the navigators leave the coast of Britain for the Island of Ogygia. (Land of the Titans, Ogres, Caribs, Cannibals or Man-eaters?)†

Five days' sail, at the rate mentioned by Herodotus, is 174 miles \times by 5 = 870 miles; or by the minimum speed of ships mentioned by Herodotus = 136 miles per day would make the total distance for the five days 680 miles.

American "clipper" ships have sailed 200 miles per day. Allowing that ships in the time of Plutarch were half as swift as these modern ships, the minimum distance to Plutarch's "Ogygia" would be 500 miles. This distance for 5 days would make the sailing rate 100 miles per day "*westward from Britain—north-west where the sun sets in summer.*" (To this we may add the coasting distance.)

(2) The course thus recorded by Plutarch, apparently in popular language, "*bearing north-west, where the sun sets in summer,*" is really quite precise, and admits of mathematical interpretation. Evidently the intent was to fix the course at a time when the sun changes its apparent position least, the bearing for this being the direction of the sun at sunset at the solstice preceding summer. If this was the intention, the record thus left of the course was very exact and the trigonometrical functions can be closely computed. That is, the language used means that this course is towards the sun at its extreme northerly declination, either in the time of Plutarch or at the time when the navigator fixed upon this course. As the narrative must have reached Plutarch when he was a man of mature years, the period can be approximately fixed. In the time of the Egyptian astronomer Ptolemy, 140 years after Christ, that astronomer observed the extreme northerly declination of the sun to be $23^{\circ} 48' 45''$ (north of the equator).

Fixing the date when Plutarch wrote at about the year A. D. 100, and noting that the secular variation in the obliquity of the ecliptic changed but slightly at this time, being only 44 seconds of arc per century, with the probable error in the astronomer's observation much greater than the annual change in the obliquity, the extreme declination of the sun at midsummer, at the time when Plutarch wrote, may not have differed much from the angular value given by Ptolemy.

Computing into modern nautical form the course given by Plutarch, for the known latitude of Britain with Ptolemy's value for the declina-

* To separate the quotations from Plutarch, from those of other authors, they are italicized.

† The "god or gods of the other world," considered as at the antipodes or "under world."

tion, by the formula for the sun's amplitude ($=A$) which is the course; then $\lg. \sin A = \lg. \secant \Phi + \lg. \text{sine } \odot\text{'s declination}$. A simple computation; made, logarithmically, as follows:

Latitude of Britain $= \Phi = 58^{\circ} 40'$ $\lg. \sec$	0.2839832
Declination of sun $= 23^{\circ} 48' 45''$ $\lg. \sin$	9.6061070
Amplitude North of West, $50^{\circ} 55' 58''$ $\lg. \text{sine}$	9.8900902
or course North $39^{\circ} 04' 02''$ West -	

Which is the mathematical approximate course representing, about the year A. D. 100, Plutarch's "North-west, where the sun sets in summer," from the British islands. This is the course from the British islands to ICELAND to-day; the sun setting "over beyond" Iceland.

(3) and (4). Iceland, therefore, is Plutarch's Ogygia; and the "three other" islands, "before it" [is reached], must be the Faroe islands; "men using to row thither in galleys," i. e. from Britain to the Faroe islands.

It is to Iceland, then, that Plutarch refers as the place (Ogygia) from which "the continent is distant about five thousand stadia"—that is onward, westward. Where is this continent?

Assuming the stadia of those times at $606\frac{2}{3}$ feet $= (606.75 \text{ feet})$, and multiplying this by the 5,000 stadia, we find the distance from Plutarch's Ogygia (Iceland) to "the continent" to be equal to 574.57 statute miles; which is, very closely, the distance from Iceland to Cape Farewell, Greenland; the historian giving the controlling points of the course. This "distance of 5,000 stadia" could not refer to the distance between Britain and Ogygia for that is $74\frac{1}{2}$ miles less, being a total of about 500 miles, with the Faroe islands about midway between, or 250 miles north-westerly from Britain and about the same distance south-easterly from Iceland; besides the present voyage of $574\frac{1}{2}$ miles is to a continent, and, the journey being continually westward, the only great headland of a continent at this distance westward of Iceland is in Greenland.

(5) Plutarch next leaps, in his narrative, to the coast of the northern continent of the New World; a not unnatural mixing up of the facts, as he wrote this narrative from hearsay—we cannot tell how many times repeated—but the description applies accurately to portions of our coasts southerly from Labrador.

The words, "the sea being there low and ebb, and difficult to be passed by great vessels because of the mud brought thither by a multitude of rivers," give us several conditions to be filled by the localities we seek.

Certainly Plutarch does not refer to Greenland at Cape Farewell, where the tide rises to a height of 12.5 feet; nor to Ungava bay, in

Hudson Straits, where one authority places the height of the tide at 67 feet; besides, at this locality, there is no "multitude of rivers."

As we approach the mouth of the great River St. Lawrence, however, we find the conditions more consistent with the records.

At Hopedale, in Labrador, a tide of 7 feet.

At Anticosti Island, Gulf of St. Lawrence, tide 5 feet.

At Anthony Strait, Newfoundland, 5 feet.

At St. Johns, Newfoundland, 6 feet.

At Trinity Bay, Newfoundland, $3\frac{1}{2}$ feet.

All fronting a region of "many rivers."

Southward, for a comparatively short distance, we find the tides to be higher and the rivers smaller, and, disregarding the tides of the Bay of Fundy—27 feet at St. Johns—as a paradox caused by the shallow, sloping bed of the bay—contracting and forcing the flow of the sea to an unusual height: we find along the New England coast:

At Hunniwell Point, Kennebec river, tide, 9.3 feet.

At Portland, Maine, tide, 9.9 feet.

At Boston, Mass., tide, 11.3 feet.

At Newport, R. I., tide, 4.6 feet.

At New London, Conn., tide, 3.1 feet.

At New York, N. Y., tide, 5.4 feet.

At Cape May Landing, N. J., tide, 6.0 feet—

The four last mentioned ports best satisfying the conditions or description given by Plutarch—notably at the Connecticut and Newport, so near the site where the "skeleton in armor" was found.

Southward of Cape May to Florida almost every river mouth has tidal conditions and "bars," if not "shelves," the tides being:

At Chesapeake Bay, Point Lookout, tide, 1 to 3 feet.

At Hatteras Inlet, North Carolina, tide, 2.2 feet.

South Carolina inlets, tide, 2 to 7 feet.

Florida Inlets, tide 1 to 2 feet.*

So that the "sea" is here indeed "low and ebb, and difficult to be passed by great vessels."

(6) "*Whence anciently arose an opinion of its being frozen*"—that is the sea and the rivers and harbors—and this we know to be true of the sea at Baffins Bay, and for the harbors even to New York at times; so that Plutarch need not have been cautious in crediting this ancient opinion.

(7) That the coasts of this continent, visited by Plutarch's navigator, were located in the frozen zone† on our side of the Atlantic is, however, certain from his narrative, for he now gives the latitude of the bay

*The tide values given above are spring tides, according to the U. S. Coast and Geodetic Survey; and agree with records in the American Practical Navigator.

† In winter.

whose shores, he says, were inhabited by the Greeks on this continent. He describes this bay as "*not much smaller than the Maeotic.*" * By "the Maeotic" Plutarch means the sea known to the ancients as the *Palus Maeotis*, now called the Sea of Azof, the shallow north-eastern gulf of the Black Sea. The town of Azof, at the mouth of the river Don, on this sea (the Maeotic), is in north latitude $46^{\circ} 53'$, according to one authority, or $47^{\circ} 07'$, according to another.

Of the location of the similar gulf "not much smaller than the Maeotic," Plutarch says that its "*mouth*" lies "*in a direct line over against that of the Caspian Sea,*" thus indicating its latitude.

"*In a direct line over against that of the Caspian Sea,*" can have only one meaning, when the historian is describing a harbor at such a vast distance, more than a quarter of the distance in longitude around the world. It can mean only a line of parallel crossing the true meridian at the mouth of the Caspian Sea. But the Caspian has no mouth that appears as such upon the maps, and we must search again the annals of antiquity to ascertain the meaning of the "mouth of the Caspian." The pages of Pliny, Suetonious or Tacitus may perhaps enlighten us; in fact we find that a pass through the Caucasus was known as the *Pylæ* or *Portæ* of the Caspian; but this hardly answers to meaning of "mouth." The mouth of a sea, like the mouth of a river, should be its place of outlet—but the Caspian has no outlet. † May we consider the mouth of the great river, now called the Volga, the ancient "mouth of the Caspian" to which Plutarch refers? It is the great river of the Caspian; its mouth nearly in the same latitude as "the Maeotic," which Plutarch mentions in the same breath, and between the mouths of the Volga and the Don, from the Maeotic to the Caspian, from Azof to Astrachan, is a natural route of travel; may we not assume that this is the "mouth" of the Caspian of Plutarch? If this be so, then in a "direct line over against the [mouth of] the Caspian," being at right angles to the meridian; even as Sicily is "over against Italy," as Sardinia is over against Naples; as Majorca is "over against Sardinia;" as Spain is "over against Majorca," or the Azore Islands are "over against Spain;" so is the Gulf of the St. Lawrence "over against the Maeotic"—that is, nearly in the same latitude; for the latitude of the "mouth" of the Caspian (mouth of the Volga) at the city of Astrachan, is $46^{\circ} 21'$, being almost due east of Azof, on "the Maeotic." Perhaps by "mouth" of the Caspian a crossing from the most proximate bends of the Volga and the Don was meant, and this would make the mouth of outlet of travel nearly as far north as latitude $49^{\circ} 00'$.

The chief mouth of the Gulf of St. Lawrence is just above latitude N. $46^{\circ} 00'$; the east point of Anticosti Island in said Gulf is in N. lati-

* See map in Rawlinson's Herodotus showing the Mæotic ancient area about one-third that of the Black Sea (Pontus Euxinus) and the river —————.

† Oarus (Volga) connecting or emptying into the Mæotic.

tude 49° 05', and the Gulf of St. Lawrence is actually "a bay not much smaller than the Maeotic"—the size of the Gulf of St. Lawrence being almost the same as that of "the Maeotic," or Sea of Azof.

The identification appears to be complete, and the Gulf of St. Lawrence must have been the site of the colony mentioned by Plutarch—within the coast of Newfoundland—reached to-day by fishing craft from France, without great trouble or danger.

(8) The colony, which Plutarch in his devotion to his own nation asserts was founded by the Greeks, was located "*about the shores*" of the Gulf of St. Lawrence, and these people esteemed "*themselves the inhabitants of the firm land*" [the continent], "*calling all others islanders*," etc., doubtless with regard to other settlers in what are now called New Foundland, Cape Breton and the many other islands at the mouth of the St. Lawrence—"lands encompassed round about and washed by the sea;" all of these people being, probably, only voyagers and traders, temporarily resident for purposes of barter for furs, fish or even for the copper of the prehistoric workings of the Lake Superior mines; carvers of the Dighton rock; comrades of the buried warrior in armor.

(9) Plutarch next places the discovery of this continent far back beyond the records of history, and tells of "*those who heretofore came thither with Hercules*,"—who thus appears to be the earliest accredited discoverer of our continent; greatly venerated and regarded as the father of the country,—whose Colonists [habits, etc.] having been "*brought under and supplanted by the languages, laws and manners of the barbarians*," they [the Colonists brought by Hercules returning to Europe (?)], "*made it [the Greek nation] again flourish and recover its pristine vigor*:" and, as their ancestor and law-giver, "*in that place they give the first honor to Hercules, and the second to Saturn*."

(10) The reference to Saturn apparently reminds Plutarch of something omitted, so he begins the voyage over again (whether at Britain, Iceland or Greenland—he probably was not sure himself—all being hearsay to him), and, incidentally, he fixes the period of the voyage by mentioning an astronomical phenomenon as to the time when the voyage should be begun, fixing it by the position of the planet Saturn in a particular sign of the zodiac, saying:

"Now when the star of Saturn, by us called *Phaenon* and by them *Nycturus*,* comes to the sign *Taurus*, as it does once in the time of thirty years;" which proves him to be proximately accurate in his knowledge of the periodic place of that planet, and fixes the time of departure of the navigators as early in the spring—the proper time to start from the Mediterranean so as to reach Iceland and Greenland in

* The word *Nycturus* (for Saturn) suggests the possible origin of St. Nicholas, Nick, old Nick (ancient Saturn), Satan, i. e., the false god.

summer, the most favorable season of the year. Even at the present day this phenomenon occurs in the spring time, the latest occurrence having been on the 17th of April, 1881.

There is something very remarkable about their having selected the period of Saturn's revolution about the sun; "thirty years,"* the lifetime of a generation of men, as the time required in which to make the entire voyage. The statement, also, that these men have "*to row in that vast sea*," indicates the use of galleys, perhaps over seas left shallow by some submarine volcanic upheaval. Perhaps, however, these stories of long years and repelling toils were described by the ancient navigators to deter others from visiting their trading posts of prehistoric Hudson Bay companies and Lake Superior copper mining syndicates; not to say silver and gold mining companies in Mexico or Peru.

(11) Plutarch having started his voyagers at the coming of the planet Saturn into the sign Taurus (spring time), now goes over the itinerary of this great journey with more detail, and describes the navigators going "*first ashore at those opposite islands*"—that is, islands north-westward from Britain (which, Plutarch says, were inhabited by the Greeks), saying—"where they see that the sun is scarce hidden one full hour during the space of thirty days."

(12) This, surely, is definite enough; such place, or island, can only have been close to the Arctic or Polar circle. The data is not great, nor is it very precise for ascertaining the latitude to the second or even minute—for the year and day and exact length of the night are not given. There is, however, sufficient data for a rough computation. Assuming the passage to mean (as it must mean) that when the sun was at its greatest northern declination it was hidden from sight a minimum time of only one hour in twenty-four; then such night being only one short hour long, the *hour angle of such minimum night* for the horizon of the place he mentions could not have exceeded fifteen degrees ($15^{\circ} 00'$) of arc; the sun bearing about N. $7^{\circ} 30'$ W. at sunset, and N. $7^{\circ} 30'$ E. at sunrise. Using the declination of the sun as already computed in this paper for the time of Plutarch = $23^{\circ} 48' 45''$ the latitude of the place mentioned by Plutarch may be roughly computed, from the statement he makes, and I find his "Island" to be in north latitude $65^{\circ} 58'$, or nearly $66^{\circ} 00'$ —*which parallel passes through the island of Iceland*, and, crossing the ocean westward, reaches the coast of Greenland. The "5,000 stadia" from Iceland reaches, as before mentioned, to Cape Farewell at the southerly point of the great Arctic continent.

Considering carefully, it is evident why Plutarch was so particular in repeating and explaining about this point of departure.

* This period is placed by Prof. Simon Newcomb at $29\frac{1}{2}$ years for the present time.

The Arctic is an exceedingly wild and dangerous sea, and exact sailing directions are here most necessary. That the last mentioned locality was close to the Arctic circle we have further evidence in the next statement of the historian relative to this island "*that this is their night, of which the darkness is but small, as having a twilight from the going down of the sun not unlike the dawning of the day*"—a fine description of the twilight night of the zone close to the Arctic circle. Plutarch's directions are true and sufficiently exact.

(13) Three months having passed, in the brief summer season of the far north; the ancient navigators, honored for their valor and knowledge of navigation (probably also esteemed for the value of their merchandise, brought by them for purposes of trade), being deemed prodigies or even "*holy men*"—winter approaching, possibly calling themselves "*children of the sun*," perhaps purposely utilizing the solar myths of the age, set out westward and southward on the extension of their voyage, following the bright orb of day as it changes its declination southward. Thus they are "*conducted by the winds and transported into the isle of Saturn*" a remote and uninhabited country, idiographically the land of Chronos, the father of time,—the most ancient country, the World's fatherland—for some cause then nearly vacant and desert. In this remote country, the historian tells us, the law required the European voyagers to remain thirty years, "*serving Saturn*," the god of the *golden age*, as he was called by the Romans.

This description of Saturn recalls to mind both ancient and modern references to rulers upon this continent afterwards idolized as gods; chieftans whom Sir Walter Raleigh sought in vain in South America, finding no golden City of Manoa and no "*El Dorado*;" for we now know from the studies of Lieutenant Lemly that El Dorado was a man, "perhaps a veritable King, whose daily attire is said to have been a simple coating of aromatic resins followed by a sprinkling of gold dust."

Mythology speaks of Saturn as the god (or king) of the "*golden age*." Indian legends led Raleigh and the Spaniards to seek for him as "*El Dorado*"—the gilded one—had Pizarro already found him? How did Plutarch describe him?

The historian cautiously recites "*For they say that Saturn himself is personally there, lying asleep in the deep cave of a hollow rock, shining like fine gold.*"* Elsewhere, Plutarch tells how they obtain "*good stores*," etc., in "*vessels of fine gold*"—the choice metal of Saturn's time.

We find, therefore, that the Carthaginian or Phœnician voyagers (whoever the first discoverers were), found also El Dorado, the gilded king, and we find that the first possessing that dignity was the man

* Is it the cavern or the god who is gilded?

(king or ruler) afterwards called the god Saturn, the father of Jupiter, Neptune and Pluto, who were subsequently esteemed as greater than he.

The golden images of the Chibchas of Peru, show "El Dorado" with his children; eight or nine golden images surround him*—children or satellites—which, as the ancients knew the planet so well, would suggest that the Peruvians must have had superior telescopes, commanding visions of Saturn's eight moons! As Saturn is said to have destroyed most of his children, may not the eclipses of these satellites have led to assigning the name of Saturn to that particular planet? Is it credible that what man has discovered in our own days was impossible to the prehistoric races? Yet here we touch upon the uncertain and hypothetical, and can only mention these surmises as singular coincidences. Is it possible that the golden image of "El Dorado" from Peru, with its satellite figures are of modern manufacture; made with these subordinate figures because Saturn has eight satellites? This is not probable, because until this moment, I think, no one has associated in modern story the names of Saturn and El Dorado—the father of time with the golden images of the Chibchas. As for telescopes, we know that the Egyptians are said to have had reflecting "perspectives" (magnifiers), and that it is asserted that Ptolemy Euergertes had upon the tower of the Pharos a "mirror which reflected all of Lower Egypt and the sea to a distance of one hundred leagues"—which was, of course, a reflecting telescope of high power; and Egypt is claimed to have had communication with Central America.

Be this as it may, it was upon the southern continent of this so-called "New World," that the Indian Cacique † "El Dorado" dwelt covered "from head to foot with adhesive turpentine, upon which had been sprinkled much gold in fine powder, which sticking to the turpentine, became a coating or second skin of gold, that upon a clear day shone resplendently in the rising sun, this being the hour selected for the ceremony," and then, washing "in the lake, all the gold fell into the water," and he "resumed his mantle"; probably a method of procuring gold from the natives as though necessary for a great religious ceremony; a ceremony coming down from the time of Saturn to the "cacique ‡ de la Provincia El Dorado," the land where the king (or cacique) "gilds his body before offering sacrifice."§

* "Who was El Dorado?" Lieut. Henry Rowan Lemly, in *Century Magazine*, October, 1891, p. 890. The one small image or satellite, behind "El Dorado," may symbolize the eclipse of a satellite.

† Father Simon's Narrative.

‡ The resemblance of this name to ancient Italian word *cassock* (= a coat or clothing); perhaps referring to one who is clothed (in a tropical country), is, perhaps, worthy of consideration.

§ *Ibid.* p. 887.

Now if Saturn was the original of the man "El Dorado," what more does Plutarch tell us of the island or land where the god (king or cacique) once made his residence?

(14) We learn that these voyagers are required to remain thirty years in this remote country, evidently as garrisons of fortified trading posts where they "serve Saturn" [gathering gold probably] and "*most of them choose to remain there*" being accustomed to the place because,

(15) "*Without any labor or trouble they have abundance of all things*" evidently referring to a tropical country, where the banana and other tropical fruits make subsistence easy,

(16) "*As well for offerings of sacrifices and holding festival solemnities, as to support the ordinary expenses of those who are perpetually conversant in the study of learning and philosophy.*" As the Maya priests at Uxmul and Chichen in Yucatan, and the priests of the Sun of Peru.

(17) They affirm "*the nature of the island and the mildness of the air which environs it to be admirable;*" as of the uplands of Central and Southern America.

(18) "*Some persons who, intending to depart thence, have been hindered by the Divinity or Goddess of the place,*" as was Ulysses by Kalypso on the Island of Ogygia, whence he sailed due eastward to the pillars of Hercules.

(19) "*Saturn himself is personally there, lying asleep*" — etc., shackled by slumber, — "*fed by birds with ambrosia.*" A land of dreams and sweets for,

(20) "*The whole island is filled with an admirable fragrance and perfume, which is spread all over it, as from an odoriferous fountain,*" — the land of flowers and fragrance which must be either tropical or semi-tropical; the orange blossoms and the jasmine flowers.

(21) But there are "*Dæmons*" there who "*serve and minister to Saturn,*" being those who formerly were the officers of Saturn when he held Empire and regal authority; men "*having the science of divining future occurrences;*" again, the learned priesthood, now degraded to Indian conjurors or medicine men, retiring into caves and dark chambers of mystery to consider questions of war or peace, to solve riddles or interpret dreams.

(22) But Saturn's sleep is at times interrupted, "*his awakings are Titanical* passions, or perturbation of the soul in him,*" in the mystical theology of the Grecian and Roman priests, the winds and earthquakes, probably the cyclones, tornadoes and volcanoes of Mexican or Central American coasts.

* The brothers of Saturn were Titans; perhaps the name Saturn was the origin of our word "Satan," the evil one of our ancestors, the false god or evil spirit.

(23) The inhabitants teach the stranger "*as great skill in astrology as it is possible for any one to do that has made the greatest progress in geometry*"—a kind of learning remarkably similar to that of the ancient Europeans, and suitable for the priesthood and builders of the great symmetrical structures of the Mayas and other civilized races of Central and South America—the builders of the monuments and pyramids of Yucatan, and inscribers of the symbols on these monuments.

(24) So the garrisons, having served their time of thirty years in these remote lands, desire to return home, to live out the remainder of their days (or die at home), to visit and see "*the great island; for so they called the continent inhabited by us*" (i. e. by the Grecians or Romans)—Italy, Europe, Africa.

"*After, therefore, his thirty years were passed and his successors arrived*"—that is, after the new garrisons and traders had arrived, "*having taken leave of all his relations and friends, he put to sea,*" * * "*having good store of voyage provisions in vessels of gold*"—setting sail, evidently, from Central America, Mexico or South America, where he must have procured his "*vessels of gold,*" he resume the journey.

(25) "*Now one day would not suffice to relate unto you*" all the particulars of this long voyage; "*how many nations he visited, through how many countries he passed,*" etc. Here the fatigued historian breaks the interesting itinerary of the voyage for the time; but, it will be seen, that his conclusion and final port of return implies a voyage steadily in one direction—necessarily from tropical or sub-tropical America easterly, if he is returning to Europe on this journey—for

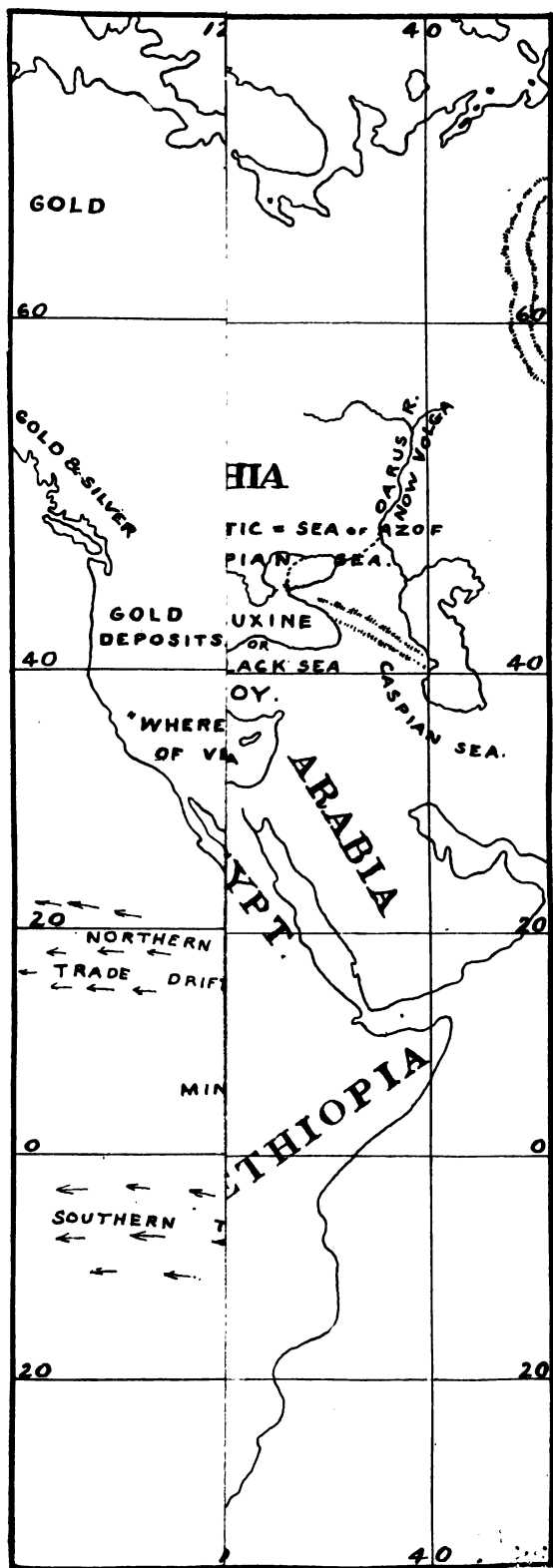
(26) "*He continued no small time at Carthage, a city not a little esteemed by us, where he found certain sacred skins of parchment, which had been secretly conveyed hither when the old town was sacked, and had there long lain hidden under ground.*" These parchments may have contained, also, the original sailing directions from which Plutarch or an earlier collector, gleaned the facts which formed the basis of that historian's account of these ancient voyages to this continent.

Thus the circuit is closed; he has crossed the Atlantic eastward and entered the Mediterranean; the traverse returns to Carthage; which, in the original records, was probably the place of its beginning; the place of return (and beginning) indicating that Phœnicians or Carthaginians, not Grecians or Romans, were the original voyagers in the dim prehistoric period before the Christian era. The last quoted paragraph of Plutarch's story says plainly that the chief secrets or knowledge of the unknown lands were found by the unknown traveler, on his way back, in Africa, and he suggests that the greatest revelations of all were those found in the parchment at Carthage.

What this parchment revealed he immediately hides in religious mysticism amidst which we again have a glimpse of the habits of the ancient people who "*in eclipses*" * * * "*are wont to ring vessels of brass and to make a noise and clattering*" to frighten the shadow from the moon, almost identical with the practice among the ancient Peruvians according to the accounts given by Ulloa; and Plutarch, also, shows that something like telescopes must have been in use in his time, for he says, "Moreover that which is called the face of the moon affrights them *when they draw near it*"—these last words indicating his mental concept of a magnified image of our satellite, for he says, it "*Seeming to them a dreadful and terrible sight,*" probably its mountains and volcano craters. "Whereas," he says, "*it is not so,*" and he describes the hollows and great depths of our satellite as though viewed by him with a telescope. And so our historian drifts away in his discourse into the mysteries of soul and spirit, both here upon earth and in the hereafter, still dreaming about those blessed lands beyond the seas "of admirable fragranciness and perfume," where, "without labor and trouble, they have abundance of all things;" dreaming, as it were, with Homer, and quoting that—

"Into the Elysian fields, earth's utmost bounds,
The gods will bring thee."


The lands reserved by Providence for us; these realms of the blest; our noble, delightful, grand and glorious country; ours for joy and happiness as long as we remain worthy of such possessions; using our knowledge, intelligence and intellect in the service of God—the Creator and Giver; or to be lost, forgotten, hidden again for ages if the race persists in idle, vain, sensuous indulgences such as those which destroyed the civilized races of the past.



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